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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,790	08/09/2006	Herbert Thanner	66376-389	9774

25769 7590 04/12/2010

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EXAMINER

SCULLY, STEVEN M

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

04/12/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/588,790

Applicant(s)

THANNER ET AL.

Examiner

Steven Scully

Art Unit

1795

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 40-78 is/are pending in the application.
- 4a) Of the above claim(s) 40-68 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 69-78 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08/09/2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/GS-08)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date 03/27/2007, 11/14/2007

**DEVICE AND METHOD FOR DETERMINING THE OPERATING PARAMETERS OF
INDIVIDUAL CELLS OR SHORT STACKS OF FUEL CELLS**

Examiner: Scully S.N.: 10/588,790 Art Unit: 1795 April 6, 2010

Election/Restrictions

1. Applicant's election without traverse of Group V, drawn to claims 69-78, in the reply filed on December 23, 2009 is acknowledged. Accordingly, claims 40-68 are withdrawn from consideration.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 75 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. With respect to the housing "serves as an interface for the electrical connections", it is the position of the examiner that this limitation is not enabled. The housing such as shown in Figure 13 has a clamping plate (205) with electrical connectors (215) mounted thereon. "The clamping mechanism 203 embraces the whole assembly and forms a mechanical frame, which functions as a housing and may serve as a mounting platform for electrical connectors 215 or as a sensor interface." Page 15 of the instant specification. There is no disclosure regarding how a housing such as shown in Figure

13, the sole embodiment including electrical connectors, would provide a working fuel cell in claim 75 (i.e. one that did not short circuit). It appears that applicant intends for the clamping plate to have electrical connectors (215), which are believed to be electrically insulated from the plate so as to prevent short circuiting, and is examined as such. Appropriate correction is required.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 71, 75 and 77 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 71 says "the two insulating elements" where claim 69 discloses "thermally insulating elements". It is unclear if applicant intends 71 to be directed to the thermally insulating elements of claims 69 and 70. Claim 75 requires "a mechanical frame which functions as a housing and serves as an interface for the electrical connections." Claim 77 much the same says "the essentially pressure-resistant, thermally insulating elements" while claim 69 discloses "thermally insulating elements". It is unclear if the elements are the same, and it is unclear if applicant intends to be further limiting the thermally insulating elements of claim 69 to be "essentially pressure-resistant" if that is the case. Further, claim 77 uses the language "...thermally insulating elements consist of a metallic grid or supporting structure." However, the thermally insulating elements *consist of* more than a metallic grid or supporting structure; it is the position of the Examiner that Applicant is intending

to claim that the elements further comprise a metallic grid or supporting structure.

Applicant is asked to clarify.

5. Claims 75 and 76 recites the limitations "the electrical connections" in line 4 and "the exterior insulation" in line 2, respectively. There is insufficient antecedent basis for these limitation in the claims. Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 69, 73 and 74 are rejected under 35 U.S.C. 102(b) as being anticipated by Hase et al. (US2003/0180590).

With respect to claim 69, Hase et al. disclose a fuel cell stack comprising clamping elements (129a, 129b) on each end of the fuel cell stack, and further comprising a thermally insulating element (127a, 127b) on each end of the fuel cell stack which transmits the clamping force to the fuel cell stack from the clamping elements (129a, 129b). See Figure 28.

With respect to claim 73, Hase et al. disclose the thermally insulating element (127a) to have openings for the passage of inlet and outlet pipes for process gases. See Figure 29.

With respect to claim 74, Hase et al. disclose clamping elements (129a, 129b) held together by a spring (135) loaded rod (133) having a nut (134) on one end for connection and clamping force. See Figure 28.

8. Claims 69-71 and 78 rejected under 35 U.S.C. 102(b) as being anticipated by Okazaki et al. (JP2000-340249).

With respect to claims 69 and 78, Okazaki et al. disclose a carbonate fuel cell having clamping elements (16, 17) on each end of the stack with thermally insulating elements (15) which transmit clamping force between the stack and the clamping elements. See Figure 1.

With respect to claim 70, Okazaki et al. the thermally insulating elements (15) to have an upper and a lower portion in contact with the clamping elements (16, 17) and side portions surrounding the fuel cell. See Figure 1.

With respect to claim 71, Okazaki et al. disclose the side portions to laterally embrace the upper and lower thermal insulating elements. See Figure 1.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claim 72 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okazaki et al. (JP2000-340249) as applied to claims 69-71 and 78 above, and further in view of Lehmeier et al. (US5,942,344).

With respect to claim 72, Okazaki et al. do not disclose providing further fuel cell components within the insulating element structure. Lehmeier et al. disclose a high-temperature fuel cell comprising an electrical heating element disposed inside a high temperature fuel cell container having thermal insulation. In consequence, only a small amount of heat is emitted into the environment surrounding the container. See column 2, lines 14-34. It would have been obvious to one of ordinary skill in the art at the time of the invention to include further components in the container so as to emit only a small amount of heat to the outside environment.

12. Claims 73-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okazaki et al. (JP2000-340249) as applied to claims 69-71 and 78 above, and further in view of Hase et al. (US2003/0180590).

With respect to claim 73, Okazaki et al. do not explicitly disclose the inlet of the fuels. Hase et al. disclose a fuel cell stack comprising clamping elements (129a, 129b) on each end of the fuel cell stack, and further comprising a thermally insulating element (127a, 127b) on each end of the fuel cell stack which transmits the clamping force to the fuel cell stack from the clamping elements (129a, 129b). See Figure 28. Hase et al. further disclose the inlet and outlet of the fuels to be at one end of the fuel cell stack. It would have been obvious to one of ordinary skill in the art at the time of the invention to include inlets and outlets of the fuels in at least one end of the fuel cell stack to ensure all unit cells were properly reached.

With respect to claim 74, Okazaki et al. disclose clamping elements with clamping bolts (18) and nuts (18B). See [0012]. Okazaki et al. do not disclose spring elements. Hase et al. further disclose clamping elements (129a, 129b) held together by a spring (135) loaded rod (133) having a nut (134) on one end for connection and clamping force. See Figure 28. It would have been obvious to one of ordinary skill in the art at the time of the invention to include springs to allow the structure to be more flexible to prevent damage when elements expand, such as the membranes of the unit cells.

With respect to claim 75, Okazaki et al. disclose upper cable (21) and lower cable (23) extending through the housing to provide electrical connection. See Fig. 1.

13. Claim 76 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hase et al. (US2003/0180590) as applied to claims 69, 73 and 74 above, and further in view of Miyao et al. (US2004/0146772).

With respect to claim 76, Hase et al. do not disclose the insulation to be made of porous ceramic material. Miyao et al. disclose a fuel cell casing. The casing is preferably made of a heat-insulating layer of porous ceramics. By employing porous ceramics having a multiplicity of fine pores inside, the heat-insulating layer is capable of exhibiting satisfactory heat-retaining property, and thereby the outer surface of the fuel cell casing can be prevented from getting hot. See [0167]. It would have been obvious to one of ordinary skill in the art at the time of the invention to use porous ceramic material for the heat insulating layers because Miyao et al. teaches it exhibits satisfactory heat-retaining properties.

14. Claim 76 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okazaki et al. (JP2000-340249) as applied to claims 69-71 and 78 above, and further in view of Miyao et al. (US2004/0146772).

With respect to claim 76, Okazaki et al. do not disclose the insulation to be made of porous ceramic material. Miyao et al. disclose a fuel cell casing. The casing is preferably made of a heat-insulating layer of porous ceramics. By employing porous ceramics having a multiplicity of fine pores inside, the heat-insulating layer is capable of exhibiting satisfactory heat-retaining property, and thereby the outer surface of the fuel cell casing can be prevented from getting hot. See [0167]. It would have been obvious

to one of ordinary skill in the art at the time of the invention to use porous ceramic material for the heat insulating layers because Miyao et al. teaches it exhibits satisfactory heat-retaining properties.

15. Claim 77 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hase et al. (US2003/0180590) as applied to claims 69, 73 and 74 above, and further in view of Iyasu et al. (US6,410,177).

Hase et al. do not disclose the thermal insulating material to have a supporting structure or metallic grid. Iyasu et al. disclose using a wire mesh or punching metal to increase the mechanical strength of a heat insulating member and provide a heat insulating member exhibiting reliability for a long time. See column 10, lines 17-28. It would have been obvious to one of ordinary skill in the art at the time of the invention to include a reinforcing wire mesh or punched metal in the thermal insulating material of Okazaki et al. because Iyasu et al. teaches it to improve mechanical strength.

16. Claim 77 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okazaki et al. (JP2000-340249) as applied to claims 69-71 and 78 above, and further in view of Iyasu et al. (US6,410,177).

Okazaki et al. do not disclose the thermal insulating material to have a supporting structure or metallic grid. Iyasu et al. disclose using a wire mesh or punching metal to increase the mechanical strength of a heat insulating member and provide a heat insulating member exhibiting reliability for a long time. See column 10, lines 17-28. It

would have been obvious to one of ordinary skill in the art at the time of the invention to include a reinforcing wire mesh or punched metal in the thermal insulating material of Okazaki et al. because Iyasu et al. teaches it to improve mechanical strength.

Contact/Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Scully whose telephone number is (571)270-5267. The examiner can normally be reached on Monday to Friday 7:30am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571)272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. S./
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795

